ATOMIC ENERGY newsletter
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Dear Sir:

Last week, before a United Nations committee, Andrei Y. Vishinsky, Soviet Foreign Minister, repeated almost verbatim a report that appeared some two weeks previous in "Nacht Express", a Russian-licensed German newspaper, that the Russians had used atomic energy to "raze mountains", and that this had reversed the direction of two Siberian rivers. (It is significant that no official statement on the subject has come from Moscow, despite two months having elapsed since President Truman announced an "atomic explosion" in the Soviet Union.) Since it would require a considerable number of atomic bombs to "raze mountains", and the plant needed would be several hundredfold that now in operation in the United States, it is not believed this production capacity is presently available in the Soviet Union... Vishinsky also stated, in this same speech, that he objected to the majority atomic control plan; the deadlock continues in the United Nations over international atomic weapon control.

The tightened security regulations of the U.S. Atomic Energy Commission, which have provoked objections by physicists and other scientists of Argonne National Laboratory (University of Chicago-operated) have been the subject of talks recently held in Chicago by AEC Chairman Lilienthal and University of Chicago Chancellor Robert M. Hutchins. New stringent security measures, stemming from Senator Bourke Hickenlooper's attacks on the Commission for lax security control, have led Chancellor Hutchins to warn that "extremist" restraints on scientists gravely endanger atomic development. However, the security question must be resolved before Argonne operating funds can be made available.

Dispersal of key government and industrial facilities, to decrease their vulnerability to atomic bomb attacks, has been made more urgent by the recent "atomic explosion" in the Soviet Union, the AEC advised the National Security Resources Board in Washington last week. The Commission's report, to the NSRB, which bears the primary responsibility for civilian defense, told how three well aimed old-style (Nagasaki) atomic bombs could wipe out the Pentagon, the Capitol area, and a third area containing the White House, State Department, and other important agencies. The Commission said that while bomb shelters could save human lives, this would not guarantee the resumption of vital functions. It recommended dispersal as achieving both these objectives.

Radiation hazards, radioactive pollution of water, sewage disposal, and insurance will be discussed at a 3-day conference to be held at New York University, Jan. 10-12, covering industrial and safety problems of nuclear technology ...The second phase of the U.S. reactor program, and the new reactors of novel design it embraces, will be covered by Lawrence R. Hafstad, AEC Director of Reactor Development, as part of the Atomic Energy Symposium at the meeting of the American Institute of Chemical Engineers in Pittsburgh, December 4-7. Other papers will treat of radioisotope production, and chemical problems in atomic energy.

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AT THE ATOMIC CITIES OF THE UNITED STATES...

RICHLAND, Washington- The dozens of physical cnanges made to the atomic piles at Hanford Works, where plutonium is manufactured, coupled with better manufacturing methods, have affected savings of $150 million. This is what replacements units would have cost, Fred C. Schlemmer, AEC manager here recently advised, if the rehabilitation program had not gone through. Improvements have also been made in methods for extraction of the plutonium from the uranium metal rods, after their irradiation in the piles. This has resulted in so reducing the amount of uranium needed that annual savings of $7 million may be tallied. In addition, the liquid wastes (resulting when the uranium rods are chemically treated during the plutonium extraction) have been decreased by about 20%, Schlemmer added, and here an annual saving of about $500,000.00 has been made. However, economic factors in the supply and demand of uranium metal, the greater part of which must be imported, have led to the adoption of a radically improved chemical separation process, Schlemmer explained. While the capital investment in this new project will exceed $100 million, he said that, if it is successful, the monetary return through raw material savings, plus other factors, will make this a profitable venture.

Precautions being taken to prevent possible contamination of the Columbia river, by radioactive effluent from Hanford Plutonium Works, were studied here last week by Pacific Northwest public health consultants. They were shown the safeguards and techniques Hanford uses to control environmental contamination by radioactive substances. The consultants, who included members of the U.S. Public Health Service, and the Washington Pollution Control Commission, will serve on the Columbia River Advisory Group.

OAK RIDGE, Tennessee- Natural gas will soon be available for the steam power-plants of the uranium-235 production units here, as the 164-mile, 22-inch pipeline from Greenbrier, N.C., to Oak Ridge, is pushed to meet a December 2nd completion deadline. The $10 million pipeline, designed by Ebasco Services, Inc., who are supervising its construction, will initially deliver 60 million cu. feet of gas daily to Oak Ridge, as an alternate fuel to the coal now being used, although the AEC estimates an annual saving of $1,228,000.00 would result from a complete changeover from coal to gas. To minimize the possibility of sabotage, the line will be buried for its entire length, and will be equipped with fully automatic main line valves. None of the spans will be exposed, and multiple crossings will be made at the major rivers encountered.

Three additional basic courses in the techniques of using radioisotopes as tracers will be given here this Winter by the Oak Ridge Institute of Nuclear Studies:; starting dates are Jan. 2nd, Jan. 30th, and March 6th, 1950...The AEC's Advisory Committee on Biology and Medicine met here last week to review the research programs in biology and medicine now underway in Oak Ridge...New AEC director of production and engineering in the Oak Ridge Operations office is K.A. Dunbar, for the last three years manager of the AEC's Dayton, Ohio, area.

LOS ALAMOS, New Mexico- A new building for radiographic research will go up here; it will be a $400,000.00 job. Bid invitation no. 291-50-36, with bid closing date Dec. 21st, has just been issued for it by the AEC here...A $3,000,000.00 additional to be spent for housing here will give residents of this atomic research center 182 more housing units. Bids have now been invited by the AEC (no. 291-50-34) for this work; bid closing date is December 21st...An underground chamber, complete with elevator, is now being constructed here by Jack Adams, of Santa Fe, low bidder for the job (no. 291-50-21).

NORWAY...

An atomic pile is to be built by Norway to supply isotopes for scientific research and medical purposes. The Norwegian Institute for Atomic Research will construct the plant at Kjeller Airdrome, near Oslo. To cost at least 15 million Kr., the installation is expected to be in operation by 1951. The necessary uranium is to be mined in Norway, where preliminary production in the southern part of the country is expected to yield sufficient quantities. Capacity of the pile will be 100 kilowatts.

INSTRUMENTS AND PRODUCTS...for nuclear work...

Manufaturers in the nuclear equipment field who will exhibit at the 22nd Exposition of Chemical Industries, being held in New York, Nov. 28th-Dec. 3rd., include: Baird Associates, Cambridge 38; S. Blickman, Inc., S. Weehawken, N.J.; Cambridge Instrument Co., New York 17; Consolidated Engineering Co., Pasadena 4; National Technical Laboratories, S. Pasadena; Photovolt Corp., New York 16; Process and Instruments, Brooklyn 22.

FROM THE MANUFACTURERS- Nuclear physics teaching kit. Consists of exposed, processed, and labelled Nuclear Track Plates, together with nuclear physics laboratory manual. A convenient form of presenting factual matter for laboratory experiments in nuclear physics--Heinicke Instrument Corp., Rochester, N.Y.

Scaler, model SC-7. Based on scale of 10, rather than scale of 2; results may be read directly, without interpolation. Manufacturer claims this feature provides greater ease in use, with more accuracy and speed. Change in output stated as less than 0.025% per 1% change in line voltage--Tracerlab, Inc., Boston 10, Mass.

Radiation area sources. To aid standardization of instruments used to detect or measure nuclear forces. Various units, from pin-points to measured areas of radiation surface, specifically designed, manufacturer states, to furnish alpha or beta particles, and gamma radiation, at an accurately known rate. --U.S. Radium Corp., New York 7, N.Y.

Scaler, type SC-200. Max. rate, 500 pulses/sec.; counting: neons to 100, relay counter to 1,000,000; scale of ten; accuracy stated at 1%.--Dynatron Radio, Ltd., Ray Lea Road, Maidenhead, Berks. (England).

Geiger-Muller tubes. Model GT-10, for beta and gamma measurement; model GTX-1, for X-ray spectrometry, alpha particles, and low energy betas; model MRCI, for liquids and powders.--Alltools, Ltd., 2, Transport Ave., Great West Road, Brentford, Middlesex (England).

ATOMIC PATENT DIGEST...latest U.S. and British applications & grants...

Radiation measurement device. Patent application no. 25504, left Oct. 4th, 1949, at British Patent Office by M. J. E. Golay.

Radioactive units and method of production. Complete specifications accepted by British Patent Office, Oct. 5th, 1949. Brit. Pat. No. 629,415, to U. S. Radium Corp.

Shallow plane proportional counter, using a gaseous mixture of approximately 97% argon, and 3% carbon dioxide. U.S. Pat. No. 2,485,516, issued Oct. 18th, 1949, to R. W. Thompson, Minneapolis, and assigned to the United States of America (USAEC).

Producing metallic beryllium, and its alloys, by reduction of beryllium fluoride. U. S. Pat. No. 2,486,475, issued Nov. 1st, 1949, and assigned to The Beryllium Corp., Reading, Pa.

Measuring the thickness of a wall or plate by directing penetrating radiation into the wall from a radioactive source, and then using a radiation detector to determine the intensity of the transmitted radiation. U.S. Pat. No. 2,486,845, issued Nov. 1st, 1949, and assigned to the Texas Co., New York, N.Y.

Gamma-ray detector, comprising a gas filled chamber, within which is a bundle of gamma-ray counters, arranged close and in parallel. U. S. Pat. No. 2,486,944, issued Nov. 1st, 1949, and assigned to the Texas Co., New York, N.Y.

Measuring the intensity of gamma radiation with a gamma-ray detector, of the counter type, and converting the output of the detector to an audible tone. U.S. Pat. No. 2,486,946, issued Nov. 1st, 1949, and assigned to the Texas Co.

Measuring the movement of a body. An ionizing source is fixed to the body, and its displacement is measured by a pair of ionization chambers. U.S. Pat. No. 2,487,216, issued Nov. 8th, 1949, and assigned to Canadian Radium & Uranium Corp., New York, N.Y.

RADIOISOTOPES...applications...

As both arsenic and irradiation had been used independently in the treatment of tumors of the hematopoietic organs, the possibility of using radioactive arsenic (arsenic-76) for such treatment was investigated by Block, Jacobson, and Neal, of Argonne National Laboratory, and the University of Chicago. (Recommending the radioarsenic for this role is the fact that it is metabolized like stable arsenic, exerts a similar chemotherapeutic effect, and is at the same time a source of irradiation.) Twenty-four patients with tumors of the hematopoietic tissues, two with polycythemia rubra vera, and one with metastatic carcinoma were treated with intravenous injections of the radioarsenic. Clinical results have led the workers to the conclusion that the radioarsenic, as used, appears to offer no advantages over the type of therapy (X-ray, urethane, phosphorous-32, and nitrogen mustard) already in use for these conditions.

The radioisotopes tantalum-182, and cobalt-60, as possible replacement for radium in industrial radiography, were recently discussed by G. H. Tenney, of Los Alamos Scientific Laboratory, at a meeting of the Society for Non-Destructive Testing, in Cleveland. The tantalum isotope (half-life 97 days) may be used for temporary installations, while the radioactive cobalt (half-life 5.3 years) is more permanent in character. While both isotopes provide higher intensities of radiation per unit volume than radium, Tenney said the cobalt-60 not only has a much narrower band of radiation than radium, but its radiation intensity per unit volume is greater by a ratio of 39 to 1. (Other advantages: Cobalt-60, at $50.00 a curie, is cheaper than radium at nearly $20,000.00 a curie--it is a lesser health hazard--it provides better resolution. See: AEN 6/21/49, "Nuclear Development Associates, of New York, recommend cobalt-60 for non-destructive testing.")

IONIZING RADIATION...investigations...

Since the anti-histamine drugs which alleviate effects of ionizing radiation also have a weak atropine action, J. C. Larkin, of the Radiology Department, New Britain General Hospital, Conn., has made studies to determine whether this protection was due to the atropine action, or the anti-histamine action of the drugs. Using seven of the anti-histamines: Benadryl, Pyribenzamine, Antistine, Trametine, Thephorin, NU-1326, and NU-1525, with irradiated mice, a slightly greater tolerance to radiation was noted. Then, to test the atropine, when used alone, mice were irradiated at 192 r/min., and injections of atropine sulphate were given daily, beginning 24 hours before irradiation, and continuing for 15 days. The average survival time for the control (no-atropine) group was 5 days; the treated mice lived 12 days. Thus, even when an absolute lethal dose was given, atropine still had an effect. Larkin believes that these results indicate the slight protection of the anti-histamines is due to their weak atropine action. He notes, however, that since ionizing radiation must produce multiple injurious reactions, the particular reaction that atropine produces is not the most important, as the protection is incomplete.

Biological effects of ionizing radiation on insects have been studied using a betatron, and two conventional roentgen-ray machines, one for deep and the other for superficial therapy (200 kv., and 100 kv., respectively) by Luce, Quastler, and Skaags, of the University of Illinois, and Michael Reese Hospital, Chicago. The insects, Drosophila Melanogaster, were subjected to several hundred r/min. Weighed averages of the mutation rate (using the C/B test of H. J. Mueller) showed that high energy rays are less effective per unit dose than the radiation from the low energy machines. (For the betatron, the mutation rate per 1,000 r was 1.4; for the 200 kv. machine, it was 2.5; and for the 100 kv. machine it was 1.6.)

RAW MATERIALS...essentials for nuclear processes...

UNITED STATES...Window Rock, Arizona- A tract of 56,720 acres of land, in the northeastern part of this state, on the Navajo reservation, has been withdrawn for three years from the public domain. The U. S. Geological Survey, under Atomic Energy Commission supervision, will conduct mineral surveys on the tract, which is north of the Carrizo Mountains.

Havre, Montana- A report of a radioactive mineral find on an Indian reservation in this state has been made by Superintendent J. W. Wellington, of the Fort Belknap, and Rocky Boy reservations. He said the minerals were found on lands of the Chippewa-Cree tribe in the Bear Paw mountains of northern Montana.

Grand Junction, Colorado- The remodeled Uravan plant of the AEC, contract-operated by the U.S. Vanadium Corp., will be ready to accept uranium-vanadium ores by the first of next year, Vanadium officials have now stated. (These minerals are found together in the carnotite ores mined in the plateau region of western Colorado and eastern Utah.) At Rifle, Colorado, the U.S. Vanadium plant is running at full capacity, while at Thompson, Utah, U.S. Vanadium are installing a crushing and sampling station for the purchase of uranium-vanadium ores from the Greenriver, Thompson, Moab, Yellow Cat, and other mining districts of the area.

CANADA- While activity has slowed down for the Winter at the Lake Superior uranium area, work is still underway at Camray Mines (the original uranium ore discovery here). Results from the west drift of the first level of the prospect shaft, which has been extended 70 feet under the lake, show narrow seams of pitchblende, varying up to one-half inch in width...At the Ransom showing, recently acquired by Coniaurum Mines, a new pitchblende stringer has just been found. Assays of two 60-pound bulk samples, from the better mineralized sections, have shown, after chemical analysis, 3.6% and 4.7% uranium oxide, respectively. ...Baska Uranium, in a recent progress report to company principals on their radioactive mineral concession in the Lake Athabaska area, state that two radioactive zones have been found, and each has been traced for 200 feet.

CZECHOSLOVAKIA- Premier Antonin Zapotocky has formally announced that uranium ores from the Jachymov mines, in northwest Bohemia, near Karlovy Vary (Karlsbad), are being shipped to the Soviet Union. (Rich pitchblende deposits here have long rated Jachymov, with the Belgian Congo, and Canada, as the "Big Three" among the world's uranium ore producers. See: "Expansion at Jachymov seen in Ministry of Industry announcement", AEN 5/10/49.)

BRAZIL- Exports of beryl ore from Brazil, the world's largest producer, have totalled 706 metric tons during the period January-March, 1949. This compares with 483 tons in the first quarter of 1948. Since 1940, the United States has been the principal market, and has received about 90% of the exports during the first quarter of this year...At Sao Paulo, a plant to work monazite sands for their thorium and other mineral content is being established. It will be the first of its kind there.

UNION OF SOUTH AFRICA- Representatives of the U.S. Atomic Energy Commission, and the United Kingdom, are meeting here to discuss with the South African Atomic Energy Board problems concerned with production of uranium in the Union. (The Prime Minister recently stated that the presence of uranium had been revealed in nearly all the Witwatersrand gold mines, and in the boreholes of the Orange Free State as a component of gold ores. However, Mr. Louw, Minister of Mines, told the House of Assembly that the uranium ore content of these gold ores was low; that no uranium had as yet been produced; AEN 7/19/49).

Sincerely,

The Staff
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